

**Mumbai University**

**Question Paper**

**[CBSGS – 75:25 PATTERN]  
(APRIL – 2015)**

**PAPER - IV**

**ELECTIVE**

**GEOGRAPHIC  
INFORMATION  
SYSTEM**

Time: 2 ½ Hours

Total Marks: 75

N.B.: (1) All Question are Compulsory.

(2) Make Suitable Assumptions Wherever Necessary And State The Assumptions Made.

(3) Answer To The Same Question Must Be Written Together.

(4) Number To The Right Indicates Marks.

(5) Draw Neat Labeled Diagrams Wherever Necessary.

(6) Use of Non – Programmable Calculator is allowed.

**Q.1 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)**

(A) List and explain the components of GIS. (5)

(B) Convert the following into degrees: (5)

(i)  $45^{\circ} 15' 45''$ 

(ii) 1745 rad

(C) Draw a diagram from the following adjacency and Incidence Matrix. (5)

	11	12	13	14
11	0	1	0	1
12	0	0	1	0
13	1	0	0	0
14	0	1	1	0

	1	2	3	4	5	6
11	-1	1	0	1	0	0
12	0	-1	1	0	-1	0
13	1	0	-1	0	0	-1
14	0	0	0	-1	1	1

(D) Explain the Region Data Model with suitable example. (5)

**Q.2 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)**

(A) List various data sources that can be used to create new Geospatial Data. Explain any one. (5)

(B) Explain the Map-To-Map and Image-To-Map Transformation. (5)

(C) Write the four types of transformation methods. Also show their effects on a Rectangular Object. (5)

(D) What is the role of control points in Affine Transformation? Give suitable example. (5)

**Q.3 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)**

(A) Explain the two types of attribute tables. (5)

(B) Explain Network Database with suitable example. (5)

(C) List different types of relationships used in relational database. Give example of each. (5)

(D) Explain: (5)

(i) Dot Map (ii) Choropleth Map

**Q.4 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)**

(A) What is Data Exploration? Explain. (5)

(B) What are the different types of graphs used for Data Exploration? (5)

(C) Explain Spatial Aggregation. (5)

(D) What is the output of the following for a statement (slope = 2) OR (NOT(Aspect=1)) (5)

3	2	1	1	1	2	2	2
2	3	3	3	3	3	1	1
1	2	3	3	2	1	1	3
2	2	3	1	1	1	2	2
2	2	2	1	1	1	1	1
3	2	2	1	2	1	2	3
3	2	3	3	3	2	2	3
2	2	2	1	3	1	3	3

1	2	2	2	1	1	1	2
2	3	1	1	2	2	1	1
1	2	3	3	2	1	1	3
2	2	3	1	1	1	2	2
2	2	2	1	1	3	3	1
3	1	2	1	1	1	2	3
3	1	3	3	1	2	2	3
1	1	1	2	3	2	2	3

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**Q.5 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)**

- (A) What is Buffering? Explain with example. (5)  
(B) Explain Slivers from Overlay Operation. (5)  
(C) What do you mean by Pattern Analysis? Explain Nearest Neighbour Analysis. (5)  
(D) Explain the following map manipulation operations with example: (5)  
(i) *Dissolve*  
(ii) *Clip*

**Q.6 ATTEMPT ANY TWO QUESTIONS: (10 MARKS)**

- (A) What is Spatial Interpolation? List and explain the types of Spatial Interpolation. (5)  
(B) Explain trend surface model with suitable example. (5)  
(C) Explain the Inverse Distance Weighted Interpolation Local Method. (5)  
(D) Define following: (5)  
(i) *Nugget*  
(ii) *Range*  
(iii) *Sill*  
(iv) *Partial Sill*  
(v) *Anisotropy*

**Q.7 ATTEMPT ANY THREE QUESTIONS: (15 MARKS)**

- (A) Explain with suitable example Cell-By-Cell Encoding Raster Data Structure. (5)  
(B) Explain the Bilinear Interpolation resampling method with suitable example. (5)  
(C) Write a short note on Map Production. (5)  
(D) Explain Spatial Data Query with suitable example. (5)  
(E) Explain the Raster Data Generalization operation with suitable example. (5)  
(F) Explain Universal Kriging. (5)
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